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| EXAMINER | |
|---|---|
| CORSARO, NICK | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2684 | |

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/514,608 | MONOGIOUDIS ET AL. | |
| | Examiner | Art Unit | |
| | Nick Corsaro | 2684 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *25 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,2,4,6-17,19-25,28-33,38 and 40-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *34-37* is/are allowed.

6)☒ Claim(s) *1,2,4,6-8,10-15,17,19-25,28-33,38 and 40-43* is/are rejected.

7)☒ Claim(s) *9 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## RESPONSE TO AMENDMENT

### *Response to Arguments*

1. Applicant's arguments filed 08/25/2004 have been fully considered but they are not persuasive.

The applicants features in the claims wherein 1 in a communication system with transceivers as opposite stations (communications endpoints) for communicating with each other and power control between said station is performed, by determining a signature of a communications channel, wherein the signature of the communications channel is a second order statistic of a signal-to-noise ratio of a signal received from the communications channel; performing power control over the communications channel wherein the power control compares a metric value and a target metric value, such that the target metric value is adjusted as a function of the determined signature of the communications channel, reads upon Kanai in view of Minde as follows.

Kanai is discussing power control in a communication system for keeping signal quality constant where the communication system is a mobile communication system. Therefore, Kanai is discloses the limitation of **communication system endpoints**. Kanai further discusses determining a parameter that describes how the communication channel is acting at the time of transmission, the parameter being the **average** Bit Error Rate (BER). BER is just one channel quality measure commonly used in checking channels. Signal to Noise Ratio (SNR), Carrier to Noise Ratio (CNR) and Frame Error Rate (FER) are others used in place of BER. Kanai is not just using one of a common set of channel quality measures, but using a statistic of the channel quality measure, namely, the average. As a consequence, Kanai has checked a parameter that is

a statistic that identifies the communication channel characteristic. Since Kanai is checking an average (a statistic) of BER, Kanai implies or gives motivation to use statistical analysis on such channel quality parameters, and therefore points toward a parameter such as signal to noise ratio (SNR) because signal to noise ratio and bit error rate are inversely proportional to each other and can be used interchangeably. Kanai then performs power control over the communication channel by comparing the BER with a BER threshold, and further adjust the threshold depending on the determination result. As a result Kanai discloses the limitation of "comparing a metric value and a target metric value, such that the target metric value is adjusted as a function of the determined parameter of the of the communications channel". Since Kanai used an average of BER, the motivation is there to look for another reference that uses a statistic of a channel quality measure; therefore, Minde is used to modify Kanai. Minde states in the background that BER is one way of checking the channel, but discusses a better way of checking the channel. That is Minde discloses using the standard deviation of the SNR to give a signature of the communication channel. The standard deviation being a second order statistic, and being a signature because the standard deviation is shows how the characteristic by using the average and thus is uniquely identifiable or a signature.

Therefore, because Kanai is doing power control base on channel quality by using a statistic of the channel quality measure, there is motivation to combine another reference that also performs a second order statistic of a channel quality measure to form a signature. Further since the primary reference Kanai is already doing an average, and the second reference Minde is performing second order statistic uses the average all that is necessary is a change of

mathematics. A change of mathematics is easily made in a processor, and Kanai is using a processor, so the change does not destroy Kanai and the invention will work after the change.

In response to the applicants argument concerning the modification of Kanai in view of Minde, by Wang and Dohi, Kanai and Minde already show power control with metric and threshold changed based on a second order statistic of the SNR. Wang and Dohi are analogous references using other of the channel quality metrics for variation of them, showing obvious to the argued features.

As a result the Applicant's arguments are not persuasive because, there is motivation to combine Kanai and Minde, Kanai and Minde are combinable to form a working method and apparatus, and combination Kanai and Minde discloses all the argued features, and Wang and Dohi merely show minor modifications to Kanai and Minde.

As a consequence the argued features read upon the cited references as follows.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4, 6, 11-13, 17, 19-20, 23-25, 29, 31, 38, 40, and 43, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanai et al. (5,386,589) in view of Minde et al. (6,157,830).

Consider claim 1, Kanai discloses a method for use in a communications endpoint (see col. 1 lines 55-68 and col. 2 lines 1-5, where Kanai is discussing power control of transmit terminals by receiver terminals, i.e., endpoints, in a cellular communication system). Kanai discloses determining a parameter of a communications channel (see col. 7 lines 16-25). Kanai discloses performing power control over the communications channel wherein the power control compares a metric value and a target metric value (see col. 7 lines 47-68, col. 8 lines 54-68, and col. 9 lines 1-13). Kanai discloses that the target metric value is adjusted as a function of the determined parameter of the communications channel (see col. 8 lines 15-55).

Kanai discloses determining a parameter of the communication channel by averaging, where logically the signal can be evaluated by other statistical methods to develop a signature (see col. 8 lines 15-68), however, Kanai does not specifically disclose a signature of communication channel, wherein the signature of the communication channel is a second order statistic of a signal to noise ration of the signal received from the communication channel. Minde teaches a signature of the communication channel wherein the signature of the communication channel is a second order statistic of a signal to noise ration of the signal received from the communication channel (see col. 5 lines 11-21, col. 5 lines 45-56, and col. 2 lines 8-20, where Minde discusses that a temporal characteristic of speech quality should be used on a parameter of the channel, such as signal to noise ratio (SNR), and where the temporal characteristic in involves standard deviation, i.e., second order statistic, of SNR over a period of time).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and have a signature of the communication channel,

wherein the signature of the communication channel is a second order statistic of a signal to noise ration of the signal received from the communication channel as taught by Minde, thus allowing the system to account for fast fading, or interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claim 11, Kanai discloses a method for use in a communications endpoint (see col. 1 lines 55-68 and col. 2 lines 1-5, where Kanai is discussing power control of transmit terminals by receiver terminals, i.e., endpoints in a cellular communication system). Kanai discloses receiving a signal from a wireless endpoint; developing a statistic from the received signal; and performing power control with the wireless endpoint as a function of the second order statistic (see col. 8 lines 25-68, col. 9 lines 1-13, lines 57-68, and col. 7 lines 47-69).

Kanai discloses taking an average of the Bit Error Rate, i.e., a statistic (see col. 8 lines 54-67), however does not specifically disclose a second order statistic, from the received signal based on a signal to noise ration of the received signal. Minde teaches a second order statistic, from the received signal based on a signal to noise ration of the received signal (see col. 5 lines 11-21, col. 5 lines 45-56, and col. 2 lines 8-20, where Minde discusses that a temporal characteristic of speech quality should be used on a parameter of the channel, such as signal to noise ratio (SNR), and where the temporal characteristic in involves standard deviation, i.e., second order statistic, of SNR over a period of time).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and a second order statistic from the received signal based on a signal to noise ration of the received signal, as taught by Minde, thus allowing the

system to account for fast fading, or interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claim 17, Kanai discloses a method for use in a communications endpoint (see col. 1 lines 55-68 and col. 2 lines 1-5, where Kanai is discussing power control of transmit terminals by receiver terminals, i.e., endpoints in a cellular communication system). Kanai discloses the method comprising the steps of measuring a parameter of a fading environment (see col. 1 lines 49-55, col. 6 lines 23-30, col. 8 lines 25-68). Kanai discloses performing power control by adjusting a target metric value as a function of the measured signature (see col. 8 lines 25-68, col. 9 lines 1-14, lines 57-68, and col. 7 lines 47-69).

Kanai discloses determining a parameter of the communication channel by averaging, where logically the signal can be evaluated by other statistical methods to develop a signature (see col. 8 lines 15-68), however, Kanai does not specifically disclose a signature of communication channel, wherein the measuring includes calculating a standard deviation value of a signal to noise ratio of a received signal. Minde teaches a signature of the communication channel, wherein the measuring includes calculating a standard deviation value of a signal to noise ratio of a received signal (see col. 5 lines 11-21, col. 5 lines 45-56, and col. 2 lines 8-20, where Minde discusses that a temporal characteristic of speech quality should be used on a parameter of the channel, such as signal to noise ratio (SNR), and where the temporal characteristic in involves standard deviation, i.e., second order statistic, of SNR over a period of time).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and have a signature of the communication channel,

wherein the measuring includes calculating a standard deviation value of a signal to noise ratio of a received signal, as taught by Minde, thus allowing the system to account for fast fading, or interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claim 24, Kanai discloses an apparatus for use in a communication endpoint (see col. 1 lines 55-68 and col. 2 lines 1-5, where Kanai is discussing power control of transmit terminals by receiver terminals, i.e., endpoints in a cellular communication system). Kanai discloses a receiver for receiving a signal, a controller for (a) developing a parameter of the communications channel from the received signal (see col. 1 lines 49-55, col. 6 lines 23-30, col. 8 lines 25-68). Kanai discloses performing power control over the communications channel by adjusting a target metric value as a function of the parameter of the communications channel (see col. 8 lines 25-68, col. 9 lines 1-14, lines 57-68, and col. 7 lines 47-69).

Kanai discloses determining a parameter of the communication channel by averaging, where logically the signal can be evaluated by other statistical methods to develop a signature (see col. 8 lines 15-68), however, Kanai does not specifically disclose a signature of communication channel, wherein the controller further determines the signature of the communication channel by collecting signal to noise ratio values of the received signal and by calculating a second order statistic of the collected signal to noise ratio values. Minde teaches a signature of the communication channel, wherein the controller further determines the signature of the communication channel by collecting signal to noise ratio values of the received signal and by calculating a second order statistic of the collected signal to noise ratio values (see col. 5 lines 11-21, col. 5 lines 45-56, and col. 2 lines 8-20, where Minde discusses that a temporal

characteristic of speech quality should be used on a parameter of the channel, such as signal to noise ratio (SNR), and where the temporal characteristic in involves standard deviation, i.e., second order statistic, of SNR over a period of time).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and have a signature of the communication channel, wherein the controller further determines the signature of the communication channel by collecting signal to noise ratio values of the received signal and by calculating a second order statistic of the collected signal to noise ratio values, as taught by Minde, thus allowing the system to account for fast fading, or interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claim 38, Kanai discloses an apparatus for use in equipment for providing power control in a cellular system (see col. 4 lines 63-68). Kanai discloses a receiver for receiving a signal from a wireless endpoint (see col. 5 lines30-67). Kanai discloses a controller for (a) developing a statistic from the received signal wherein said statistic is used to determine an adjustment to a target metric value; and (b) performing power control with the wireless endpoint as a function of the statistic (see col. 8, lines 25-68, col. 9 lines 1-13, col. 2 lines 57-68, and col. 7 lines 47-69).

Kanai discloses taking an average of the Bit Error Rate (see col. 8 lines 54-67), however does not specifically disclose a second order statistic, wherein the controller calculates the second order statistic of collected signal to noise ratio values of the received signal. Minde teachers a second order statistic, wherein the controller calculates the second order statistic of collected signal to noise ratio values of the received signal (see col. 5 lines 11-21, col. 5 lines 45-

56, and col. 2 lines 8-20, where Minde discusses that a temporal characteristic of speech quality should be used on a parameter of the channel, such as signal to noise ratio (SNR), and where the temporal characteristic in involves standard deviation, i.e., second order statistic, of SNR over a period of time).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and a second order statistic wherein the controller calculates the second order statistic of collected signal to noise ratio values of the received signal, as taught by Minde, thus allowing the system to account for fast fading, or interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claims 2, 20, and 25, Kanai discloses the metric is a bit error rate (BER) (see col. 8 lines 54-67 and col. 9 lines 1-13).

Consider claim 19, Kanai discloses the parameter of the channel includes an average bit error rate (BER) and signal power or carrier interference ratio (CIR), where the average is a statistic (see col. 2 lines 5-68), however, does not specifically disclose a signature of the communications channel where the signature is a second order statistic of a received signal-to-noise ratio (SNR). Minde teaches a signature of the communications channel where the signature is a second order statistic of a received signal-to-noise ratio (SNR) (see col. 5 lines 10-21 and col. 5 lines 45-55). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and have a signature of the communications channel where the signature is a second order statistic of a received signal-to-noise ratio (SNR), as taught by Minde, thus allowing the system to account for fast fading, or

interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claims 4, and 29, Kanai does not specifically disclose collecting signal-to-noise (SNR) values of a signal received from the communications channel; and using the collected SNR values to determine the signature of the communications channel. Minde teaches collecting signal-to-noise (SNR) values of a signal received from the communications channel; and using the collected SNR values to determine the signature of the communications channel (see col. 5 lines 10-21 and col. 5 lines 45-55). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and collect signal-to-noise (SNR) values of a signal received from the communications channel; and use the collected SNR values to determine the signature of the communications channel, as taught by Minde, thus allowing the system to account for fast fading, or interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claims 6, 23, and 31, Kanai discloses the communications endpoint is a wireless endpoint (see col. 1 lines 55-67).

Consider claim 12, Kanai discloses calculating a statistic of a bit error rate of the received signal; and adjusting a bit error rate target value as a function of the calculated statistic; and the performing step includes the step of performing reverse-link outer loop power control as a function of a comparison between a bit error rate value of the received signal and the adjusted bit error rate target value (see col. 8 lines 15-68 and col. 9 lines 1-14, where Kanai is discussing resetting the system target values to perform reverse power control, therefore, by definition Kanai is performing reverse outer loop power control). Kanai does not specifically disclose

calculating a second order statistic. Minde teaches calculating a second order statistic (see col. 5 lines 10-21 and col. 5 lines 45-55). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai, and calculating a second order statistic, as taught by Minde, thus allowing the system to account for fast fading, or interference, because the quality of the link is not shown by a mere averaging of such a parameter, as discussed by Minde (col. 2 lines 14-60).

Consider claim 13, Kanai discloses the communications endpoint is a wireless endpoint (see col. 1 lines 55-67).

Consider claim 40, Kanai discloses the metric is a bit error rate (BER) (see col. 8 lines 54-67 and col. 9 lines 1-13).

Consider claim 43, Kanai discloses a transmitter for transmitting power control information to the mobile (see col. 7 lines 48-68).

3. Claims 7-8, 10, 14-15, 28, 32-33, 41, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanai in view of Minde as applied to claims 1, 11, 24, and 38 above, and further in view of Wang et al. (6,084,904).

Consider claims 7, 10, 14, 32, and 41 Kanai and Minde do not specifically disclose the metric is a symbol error count. Wang teaches the metric is a symbol error count (see col. 7 lines 9-20, col. 5 lines 67, and col. 6 lines 1-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai and Minde, and have the metric be a symbol error count in outer loop power control, as taught by Wang, thus allowing a decrease in time over which threshold adjustments occur, as discussed by Wang (col. 2 lines 20-25).

Consider claims 8, 15, 33, and 42 Kanai, discloses the method as modified by Minde, wherein the determining step includes the step of monitoring an bit error count of a received signal for determining a standard deviation of the received bit error count; and the performing step includes the step of adjusting a target bit error count for the received signal as a function of the standard deviation for use in providing the power control (see Kanai col. 8 lines15-68, col. 9 lines 1-47, and Minde col. 5 lines 10-56, where Kanai is discussing measuring the signal quality and Minde is discussing more accurately measuring the signal quality by higher order statistical methods). Kanai and Minde do not specifically disclose a symbol error count. Wang teaches a symbol error count (see col. 7 lines 9-20, col. 5 lines 67, and col. 6 lines 1-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai and Minde, and have the metric be a symbol error count in outer loop power control, as taught by Wang, thus allowing a decrease in time over which threshold adjustments occur, as discussed by Wang (col. 2 lines 20-25).

Consider claim 28, Kanai discloses the method and apparatus, as modified by Minde, wherein second order statistics are used via processors with inherent memories for determining the statistics (see Minde col. 5 lines 10-55). Kanai and Minde do not specifically disclose using tables. Official notice is taken that both the concept and advantage of using look up tables for mapping statistical values rather than calculating all values are well known and expected in the art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai and Minde, and use look up tables to map the statistical values, thereby speeding up calculation by having some of the values previously stored for lookup.

4. Claims 21, 22, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanai in view of Minde as applied to claim 17 and 24, above, and further in view of Dohi et al. (6,341,224).

Consider claims 21, 22, and 30, Kanai discloses the method and apparatus, as modified by Minde above, wherein BER rate is measured and target values are changed such as BER or SNR. Kanai and mind do not specifically disclose changing the SNR target value. Dohi teaches changing the SNR target value (see col. 4 lines 20-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kanai and Minde, and change the SNR target value, as taught by Dohi, thus allowing accurate system capacity in quickly changing environments, as discussed by Dohi, (col. 2 lines 19-40).

***Allowable Subject Matter***

5. Claims 9 and 16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 34-37 are allowed.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nick Corsaro whose telephone number is 703-306-5616. The examiner can normally be reached on 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay A Maung can be reached on 703-308-7745. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nick Corsaro

NICK CORSARO
PRIMARY EXAMINER

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